some time back by Mr. Clibborn, the design of which resembled a section of the first piece of sculpture.

The President read a letter by Dr. Osborne on a new application of thermometrical observations for the determination of local climates, in reference to the health of invalids.

"*Dublin*, 26, *Harcourt-street*, *March* 30, 1850.

"DEAR SIR,—May I beg that you will excuse the liberty I take in laying before you the following observations, in order that they may be submitted to the consideration of the Committee of Science of the Royal Irish Academy, preparatory to the arrangements now in progress for an extensive series of meteorological observations throughout Ireland?

"In seeking information respecting climates suitable for invalids, I had always been disappointed; the most complete meteorological tables, comprising connected series of observations on the barometer, thermometer, rain-gauge, the clouds, and the winds, being quite inadequate to give a correct representation of the action of climate on the human constitution, or even on the feelings of the human body. I found some places proverbially cold, yet exhibiting the same thermometric heat as those which were hot, and *vice versâ*; and at last I came to consider the tables, however interesting they might be in physical geography, yet as almost useless to the physician or the invalid.

"To judge of the effects of heat or cold on the living inhabitants of a country, it must be recollected that they are all endowed with a certain temperature distinct from that of the surrounding air. We are bodies heated to nearly forty degrees above the average climate in this country, and consequently subjected to a continual refrigerating process. That this refrigeration does not depend on temperature alone, as is so

generally assumed in medical works on climate, but rather on the combined effect of it taken in conjunction with moisture, with currents of air, with radiation, and with variations of the densities of air, must be manifest even from a theoretical consideration of the subject; but up to the present time this combined effect does not appear ever to have been experimentally investigated. It occurred to me that, by substituting for the human body a thermometer heated to its temperature, the time in which it cooled down in any locality would afford a measure of the cooling power of all those agencies combined in that locality. Accordingly, having heated the bulb of a thermometer to 90°, that being the average heat of the surface of the body, I observed the time it required in different situations to cool down to 80°, when taken inversely, corresponded so well with what my feelings told me of the cold of those situations, that I made a variety of experiments which convinced me of its truthfulness and value.

"Having introduced a short account of it into a paper which I read at the medical section of the British Association, when in Dublin in 1835, I proposed, in order to avoid circumlocutions, that the thermometer so applied should be called a PSYCHOMETER, or measurer of refrigeration (from ψῦχος). The members present at the meeting of the section appeared to view the proposal with great interest. No objection was offered to it, and a resolution was passed appointing committees in London, Dublin, and Edinburgh (to which copies of my communication were to be furnished), with a request that they should report to the meeting to be held in the following year.

"I have to plead guilty of a great omission and of apparent disrespect towards the Association, in not availing myself of the extensive opportunity thus promptly thrown open; but, not wishing to compromise my prospects as a practising physician, by appearing before the public in the light of an ex-

perimentalist in meteorology, I took no further steps in the matter, and never furnished the copies required. Consequently, the committees were never convened, and thus the subject was dropped, and has ever since remained totally neglected, if not totally forgotten.

"Now, however, that a series of observations on the climate of Ireland is about to be undertaken, under the auspices of the Academy, I feel that I should fail in my duty to the body of which I have the honour to be a member if I did not solicit the attention of the Committee to this mode of investigation, the practical value and probable importance of which, instead of diminishing, has steadily increased in my eyes ever since I first proposed it.

"The psychometer which I use is a spirit thermometer, with a cylindrical bulb about one and a half inch long and a third of an inch thick, the stem of which is marked to denote 80° and 90°. It is readily heated for use, either with the palm of the hand, or by holding it for a few moments inside the shirt collar. It is then to be held in the locality appointed for examination, and by means of a seconds watch the number of seconds is counted during which it falls from 90° to 80°. It is assumed that the refrigeration is inversely as the time required.

"The first example I shall give of its application is furnished by my present residence, No. 26, Harcourt-street. It nearly fronts the east, where the opposite houses are rather higher, but is in the rear much exposed to the west. Now, the rooms in the rear have almost always been felt to be colder than those in the front; but the reason of this was never to be appreciated by the thermometer, as, when in the shade, it maintains nearly the same degree in both aspects. Several observations were made, in order to ascertain the difference of refrigeration between the front and back of the house, in the morning after sunrise, but in the shade, and the same number

made after sunset, during the end of the last and beginning of the present month. They were made by holding the instrument outside the attic windows, front and rear.

"From these it appeared that the refrigeration of both aspects was equal in only one instance; that it was greatest at the east, in three instances; but that, on the average, the cold of the west aspect was to that of the east nearly as 5 to 4, and that this difference appeared to increase after sunset.

"Another series of observations made for me at Monkstown, and confined to the one spot, shows how great a discrepancy may be between the indications of the thermometer and the cold produced by the air on a body heated up to our temperature. Thus, on the 8th of January, the temperature being 41°, the instrument required 40″ for cooling; and on the 9th, the temperature being the same, it cooled in 17½″, that is, in less than half the time: showing a refrigeration of twice the power. This may be explained by the *damp strong breeze* in the latter case, and the *almost calm clear atmosphere* in the other; but those are the states of the atmosphere in which we are most interested, and on the effects of which much of our health and comfort must always depend.

"It will be observed how we often suffer more severely from cold when the temperature is a little above than when below the freezing point, in consequence of the presence of moisture in the former case causing increase of conducting power. To this may be ascribed the greater cold so often felt in this climate than in continental localities, even when the temperature is many degrees below freezing point.

"If the Committee shall be of opinion that the refrigerating effects of climate in various parts of Ireland shall be investigated in the manner I have ventured to propose, I cannot refrain from anticipating much useful and much hitherto unexpected information to result; and, taken in connexion with their other meteorological researches, I should hope that in this

country, now so much thrown on her own natural resources, it may help to teach us the real influences of aspects and prevailing winds, and lead us to a scientific application of them to practical purposes. Again begging your indulgence,

"I have the honour to remain,

"Dear Mr. President,

"Your most obedient Servant,

"JONATHAN OSBORNE, M. D.,

"*King's Prof. Mat. Med.*

"*Rev. Dr. Lloyd.*"

The President observed, in reference to the preceding communication, that the cooling power of the air—as measured by the time in which a thermometer, artificially heated, cooled down through half the excess of its temperature above that of the surrounding air—had been already used by Leslie to measure the *velocity of the wind*, the effects of other causes being eliminated by means of a second observation in *still* air. This employment of a heated thermometer as an *anemometer*, although apparently not so well known as it deserved, seemed to be the most valuable application of which it was capable, considered as an instrument of *physical* investigation. The object of Dr. Osborne's inquiries was, however, rather medical than physical, and there could be no doubt that the means which he proposed were (with some modifications) adequate to the object in view.

Dr. Apjohn suggested some additions and alterations in the method of observation proposed by Dr. Osborne.

Sir William Rowan Hamilton gave an account of some geometrical reasonings, tending to explain and confirm certain results to which he had been previously conducted by the method of quaternions, respecting the inscription of gauche polygons in central surfaces of the second order.